

**Title: Mobility and clinic switching among HIV patients considered lost to follow-up in north-eastern South Africa**

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**Background:** Accurately capturing the number of HIV patients who drop out of HIV care programmes is challenging across sub-Saharan Africa. We assessed the extent of undocumented clinic transfer among patients lost to follow-up (LTFU) by antiretroviral therapy (ART) initiation reason in a rural South African setting.

**Methods:** We traced patients categorised as LTFU (over 90 days late for a scheduled clinic visit) in 8 clinics within the Agincourt Health and Demographic Surveillance System (AHDSS) in rural north-eastern South Africa to ascertain their “true” outcomes. Tracing involved reviewing clinic and routine tracing records and conducting supplementary tracing for patients for whom an outcome could not be ascertained. We also compared patients that were LTFU against demographic surveillance data, to ascertain migration or mortality events.

A spatial analysis was conducted to assess patterns of movement between clinics. Google maps was used to ascertain decimal degree coordinates Using ArcMap 10.3.1, the coordinates were imported to shape files with a WGS 1984 coordinate system.

**Results:** Of 1017 patients LTFU that were traced, 120 (11.8%) had died, 75 (7.4%) were alive and not on treatment, 49 (4.8%) had migrated, 315 (31.0%) had transferred to another facility, 225 (22.1%) had re-engaged in care and 111 (10.9%) were known to be alive but their treatment status could not be ascertained.

Of the 315 patients who transferred, 131 (41.6%) did so to facilities within the HDSS, 89 (28.3%) to other clinics in Mpumalanga, 37 (11.8%) to Gauteng, 25 (7.9%) to another named province, and 7 (2.2%) out of the province but with no new facility specified; 23 (7.3%) had transferred without any indication of their final destination. Of 131 transfers within the HDSS, 105 (80.2%) were undocumented, of 184 transfers out of the HDSS 77 (41.8%) were undocumented.

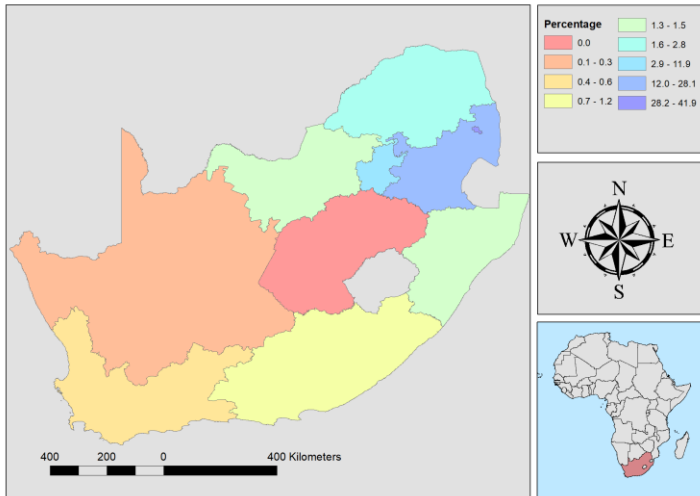
Eighty-two (29.3%) of 280 Option B+ women had transferred compared to 176 (36.1%) of 487 non-pregnant women and 57 (22.8%) of 250 men that were LTFU. Forty-six (56.1%) of Option B+ women transferred to a facility within the HDSS compared to 67 (38.1%) of non-pregnant women and 18 (31.6%) of men. Sixteen (19.5%) of Option B+ women transferred to a facility in the same province compared to 55 (31.3%) of non-pregnant women and 18 (31.6%) of men. Two (1.1%) non-pregnant women transferred out of the country.

**Conclusions:** We found evidence of continued care after LTFU and identified local and nationwide clinic mobility among HIV patients. High rates of undocumented local clinic transfers among patients LTFU, and particularly among Option B+ women may suggest patients are “shopping” for an ideal clinic, changing due to dissatisfaction or related to change in residence. Undocumented transfers pose a risk with regards to drug resistance, as this misclassifies treatment experienced patients as treatment naïve and may lead to patients being offered regimens that have lost their optimal therapeutic benefit. A linked database will be needed to improve ascertainment of patient outcomes among more mobile patients.

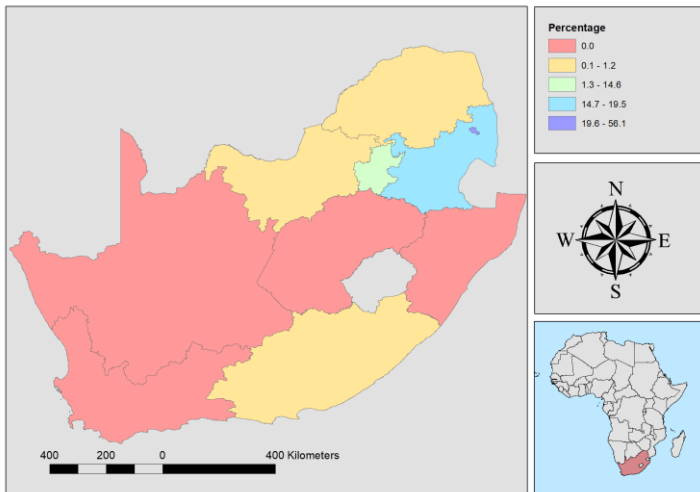
**Table 1:** Demographic and clinical characteristics of patients that transferred to another facility

	LTFU	Transferred
	1017	315
	N (%)	N (%)
Age		
18-29	333 (32.7)	117 (37.1)
30-44	484 (47.6)	147 (46.7)
45-59	141 (13.9)	38 (12.1)
>=60	58 (5.7)	13 (4.1)
Missing	1 (0.1)	0 (0)
Sex		
Female	767 (75.4)	258 (81.9)
Male	250 (24.6)	57 (18.1)
ART initiation reason		
Non-PMTCT	737 (72.5)	233 (74.0)
PMTCT	280 (27.5)	82 (26.0)
Baseline CD4		
<100	206 (20.3)	64 (20.3)
100-199	185 (18.2)	46 (14.6)
200-349	261 (25.7)	69 (21.9)
350-499	193 (19.0)	72 (22.9)
>=500	145 (14.3)	53 (16.8)
Missing	27 (2.6)	11 (3.5)
Refill schedule		
1 month	672 (66.1)	210 (66.7)
2 months	233 (22.9)	71 (22.5)
3 months	79 (7.8)	30 (9.5)
>3 months	33 (3.2)	4 (1.3)
Transfer facility location		
Agincourt HDSS	—	131 (41.6)
Rest of Mpumalanga	—	90 (28.6)
Gauteng	—	37 (11.8)
Limpopo	—	9 (2.9)
KwaZulu Natal	—	5 (1.6)
Eastern Cape	—	4 (1.3)
Western Cape	—	2 (0.6)
Northern Cape	—	1 (0.3)
North West	—	4 (1.3)
Out of province	—	7 (2.2)
Out of country	—	2 (0.6)
Unknown	—	23 (7.3)
Median days to transfer (IQR)	—	22.5 (1, 245)

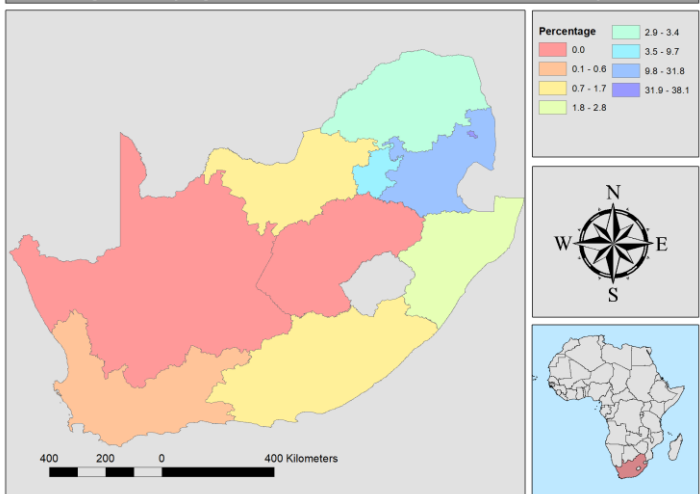
Percentage of all patients that transferred to clinics in each province



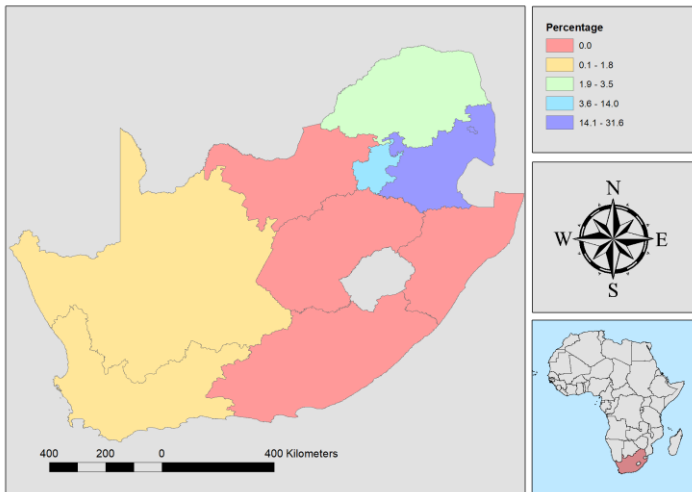
Percentage of pregnant women (Option B+) that transferred to clinics in each province



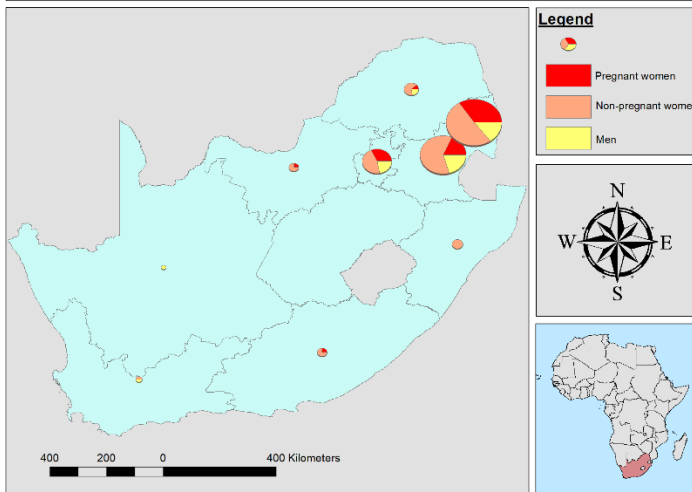
Percentage of non-pregnant women that transferred to clinics in each province



Percentage of men that transferred to clinics in each province



Proportions by sex and pregnancy status at ART initiation that transferred to each province



Size and proportion of types of transfers to each province

